**Physics Post- test Final Exam Review Sheet**

1. Define
   1. Chaos theory **Small differences in initial conditions yield widely diverging outcomes**
   2. Time dilation **stretching out of time due to motion**
   3. Electric diode- **allows** electricity **to flow in one direction only**
   4. Vibration- **a wiggle in time**
   5. Inertia- **resistance of any physical object to a change in its state of motion or rest**

**Matter**

Divide object into 2 parts. What happens to Surface area/volume ratio- **Whatever factor you increase the length, width or radius by, the area increases by that factor squared, and the volume by that factor cubed. The square cube law means that if you doubled a person's height they'd have four times the area but would weigh about eight times as much.**

1. Buoyancy occurs when\_\_\_\_\_\_\_\_ **Buoyancy = weight of displaced fluid; wt of fluid = wt of floating object or at bottom**
2. Most buoyancy, submerged or floating? **Submerged has more buoyancy b/c it displaces more water**
3. The faster a fluid flows, the \_\_\_\_**lower (vacuum)**\_\_\_the pressure
4. Plasmas are like a gas which can \_\_\_\_\_**carry a current**\_\_\_\_
5. Which has most thermal energy? Higher temp when given examples (**cup boiling water or iceberg)**
6. Why does a sparkler not burn you? **spark has a very high temperature but has so little mass that no significant heat is transferred**
7. Relate temperature to wavelengths (shorter, longer). **Hotter temp have shorter wavelengths.**

**All objects emit electromagnetic radiation, and the amount of radiation emitted at each wavelength depends on the temperature of the object. Hot objects emit more of their light at short wavelengths, and cold objects emit more of their light at long wavelengths.**

1. What loses/gains heat fastest?- colors **black objects both absorb and radiate heat** faster **than other** colors
2. Energy is absorbed/lost during condensation and evaporation. Identify and explain why one is a cooling process and the other is a warming process. **Evaporation goes from liquid to a gas & gains energy from surroundings (cools); most energetic particles leave first. Condensation was a gas and loses energy to env to become a liquid (warms).**
3. Why does the temperature of something freezing or boiling not change when heat is applied? **Temperature does not change if undergoing a change in state;** **Any additional heat added/removed to the material will not raise/change the temperature until all of the material has reached that state.**
4. What is a Chinook? a warming wind or weather system due to adiabatic heating; **there is no net heat transfer between a system and its surrounding environment;** Adiabatic **cooling happens as air mass expands with increasing elevation; Air that sinks will warm** adiabatically
5. What is a temperature inversion? **condition in which the temperature of the atmosphere increases with altitude in contrast to the normal decrease**

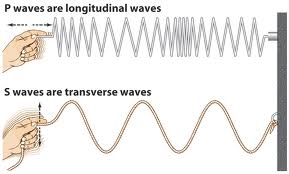
Motion

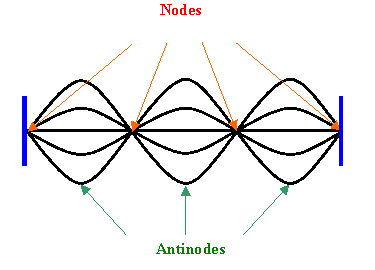
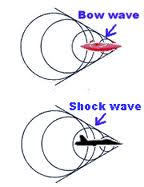
1. If the sun collapses (same mass) what will happen to earth? **It will stay in same orbit**
2. Path of object if released from centripetal force- **straight line in whatever direction it was moving**
3. Inertia- **resistance of any physical object to a change in its state of motion or rest, or the tendency of an object to resist any change in its motion; *moves with constant velocity***
4. **Problems of dropped or projectile objects (9.8 m/s 2); Throwing something up and falls back in 2 seconds- goes up 10 meters. As things fall, they fall faster.**
5. Effect of mass and gravity at different locations. **Mass stays the same, weight depends on mass attracting it**
6. Problems involving determining
   1. Weight when given mass- **weight = mg**
   2. Accelerations of gravity- **9.8 m/s2**
   3. Velocity and acceleration change of falling object- **velocity may increase, acceleration stays same**
   4. Momentum’s affect; p = mv; conservation of momentum- **equal & opposite**
   5. When is work done when given example- **object must move in relation to object moving it or no work done**
   6. Balancing a stick is easiest when\_**heavy part is up**\_ because\_**it has more inertia/more needed to move it**
   7. Rotational speed change /affects- **the tighter the circle, the faster the spin**
   8. Relationship between mass & gravity- **closer to the center of the mass, the less density & the greater the gravity; greater masses = greater gravity**
   9. Falling objects lose speed faster because of increased \_**air resistance**\_\_\_ than going up.

**Electromagnetism.**

1. What is the relationship between magnets, wire coils and electricity? **moving magnet/coil of wire in relation to each other produces a current which forms an electromagnet**
2. Why are an electric motor and electric generator very similar?Generators **are devices that turn mechanical energy into** electrical **energy.** Electric motors **are devices that turn** electrical **energy into mechanical energy**
3. Why is AC and not DC used in houses? **AC can be moved over long distances using transformers**
4. What causes magnetism? **When the net spin of electrons are in the same direction**
5. What charge does a wire carrying a charge have? **0- It does NOT**
6. What is the source of electrons in a circuit? **The circuit itself**
7. Resistance & lamp brightness relationship in series & parallel circuits- **adding lamps in parallel reduces the resistance on each.**
8. Force which holds atoms together- **electrical**
9. Purpose of lightning rod- **diffuse build up of ions; Then provide safe path to ground**

**Sound**

1. What type of wave is sound? **Longitudinal- not move In vacuum**
2. Categorize rate of speed in solid, liquid, gas, vacuum: **sound travels faster in** solid **next is** liquid **then** gas- not at all in vacuum; **Speed of sound in hot objects > cold objects**
3. [](http://www.google.com/imgres?q=transverse+longitudinal+waves&um=1&safe=active&hl=en&rls=com.microsoft:en-us:IE-SearchBox&rlz=1I7MXGB_enUS534&biw=1024&bih=551&tbm=isch&tbnid=Vd1-o3YDwJCc7M:&imgrefurl=https://gcps.desire2learn.com/d2l/lor/viewer/viewFile.d2lfile/6605/8091/index.html&docid=3DGqN-1fYJP6yM&imgurl=https://gcps.desire2learn.com/d2l/lor/viewer/viewFile.d2lfile/6605/8091/longitudinal%252520and%252520transverse%252520waves.jpg&w=1400&h=846&ei=M1eVUa63CoLorAHig4DQAw&zoom=1&iact=rc&page=1&tbnh=142&tbnw=236&start=0&ndsp=12&ved=1t:429,r:5,s:0,i:95&tx=76&ty=55)Movement of particles in transverse **(at right angles to wave direction)** & longitudinal waves **(particles move in same direction of wave motion).**
4. What is a node? Antinode?, bow wave?

 [](http://www.google.com/imgres?q=bow+wave&um=1&safe=active&hl=en&rls=com.microsoft:en-us:IE-SearchBox&rlz=1I7MXGB_enUS534&biw=1024&bih=551&tbm=isch&tbnid=teLGplkDU8B4hM:&imgrefurl=http://www.wonderquest.com/sonic-booms.htm&docid=rfHf_8poWBLhdM&imgurl=http://www.wonderquest.com/images/2005-12-06-Fig4-bow-wave-shock-wave.gif&w=180&h=234&ei=klWVUemCBM3aqQGmrIH4Cw&zoom=1&iact=hc&vpx=88&vpy=229&dur=1063&hovh=187&hovw=144&tx=93&ty=131&page=1&tbnh=152&tbnw=119&start=0&ndsp=15&ved=1t:429,r:6,s:0,i:98)bow wave- **objects move faster than wave speed**

1. Pendulum swing time dependent on\_\_\_**length & distance from gravitational source**\_\_\_

Light

1. Light travels along a path of least \_**time**\_\_
2. If light is a wave, why is it bent by gravity or massive stars? It is affected by both gravity and magnetism
3. Brightest color is \_\_**greenish yellow**\_\_\_; hottest color (star) is \_\_**blue (violet)\_\_\_\_**
4. Describe electromagnetic spectrum- visibility **most is invisible** **(only light - a small part is visible),** speed- **all have light speed**
5. Vision is dependent on amount of light. In low light, Black & white vision is provided by \_\_**Rods\_\_** and bright light produces color vision provided by \_**cones**\_\_\_
6. Differences between radio waves and sound waves **Sound waves (longitudinal) require matter in order to travel; electromagnetic waves (radio ) Transverse- can travel where matter is not present**

Nuclear

1. All uranium will eventually become \_\_**lead**
2. Describe the 3 types of radiation based- radiation **(through a vacuum, convection (in fluid) conduction (touch)**
   1. Which are particles of pure energy? **Gamma; no electric charge**
3. How do you control a fission reaction? **Absorb the neutrons**

Solar System

1. What is a black hole? **a region of spacetime from which gravity prevents anything, including light, from escaping; formed from the gravitational collapse of a giant star**
2. Effect on surrounding planets? Orbits- **a star that collapses will have the same gravitational force and existing orbits will remain the same**

Quantum & Relativity

1. How does gravity affect time? **Slows it**
2. What happens when matter & antimatter collide? **in a** matter**-** antimatter collision**, all the mass (an equal amount of each) is converted into energy. Ex. 10 g matter + 5 g antimatter = 5 g matter + energy**
3. When will a decision based on facts need to be re-evaluated? **When new information is obtained**